Validator Provided

Appendix B
Certified Validation Report Template, Part A: Provided by Validator

Audit Information:

Water Supplier Name: Desert Water Agency **PWS ID:** 3310005

System Type: Potable **Audit Period:** Calendar Year 2019

Utility Representation: Heather Marcks senior engineering technician

Validation Date: 9/24/2020

Validation Findings & Confirmation Statement: Sufficient supporting documentation was provided by the Supplier for the 2019 Water Loss Report.

Key Audit Metrics:

Data Validity Score: 62 **Band (Level):** Band III (51-70)

ILI: 0.37 **Real Loss:** 7.14 (gal/conn/day) **Apparent Loss:** 13.05 (gal/conn/day)

Non-revenue water as percent of cost of operating system: 3.2%

Certification Statement by Validator:

If not, rejected recommendations are included here.

This water loss audit report has been Level 1 validated per the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34.

All recommendations on volume derivation and Data Validity Grades were incorporated into the water audit.

Validator Information:

Water Audit Validator: Sarah Rapolla Qualifications: Water Audit Validator Certificate issued by the CA-NV Section of the AWWA

Certified Validation Report Template, Part B: Provided by Utility

Utility Provided

Water Supplier Name: Desert Water Agency **Water Supplier ID Number:** 3310005 **Water Audit Period:** Calendar Year 2019

Water Audit & Water Loss Improvement Steps:

Utility provided steps taken in preceding year to increase data validity, reduce real loss and apparent loss as informed by the annual validated water audit:

- Customer meter inaccuracy data validity increased from a 5 to a 7 due to getting the customer meter testing program underway. We have started testing regularly but the program is not fully operational with a plan on best meter replacement practices yeat.
    - Expand customer meter bench testing program to get better representation of meter accuracy and develop meter replacement program based on sound data of life expectancy instead of blanket 20 year replacement
- 4.63 miles of aging mains with known elevated rates of leaks and breaks abandoned and replaced in the water system to mitigate real water loss
    - Continue aggressive gaining pipeline replacement program based on age, leak/break frequency and severity and other factors.
- Start groundwork on implementing a GIS & asset management program to better track infrastructure.
- Begin discussions on better supply meter accuracy testing and maintenance practices.

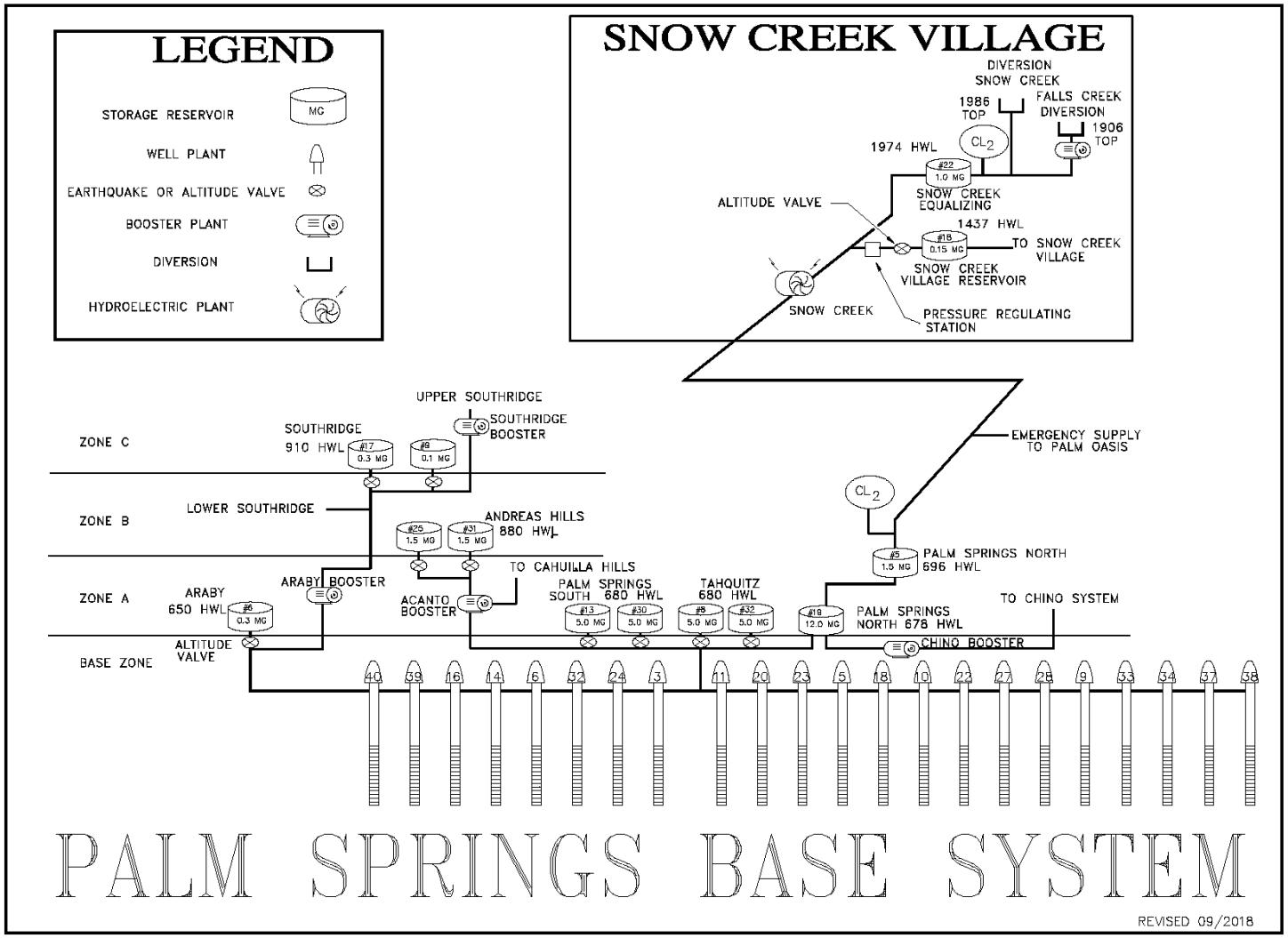
Certification Statement by Utility Executive:

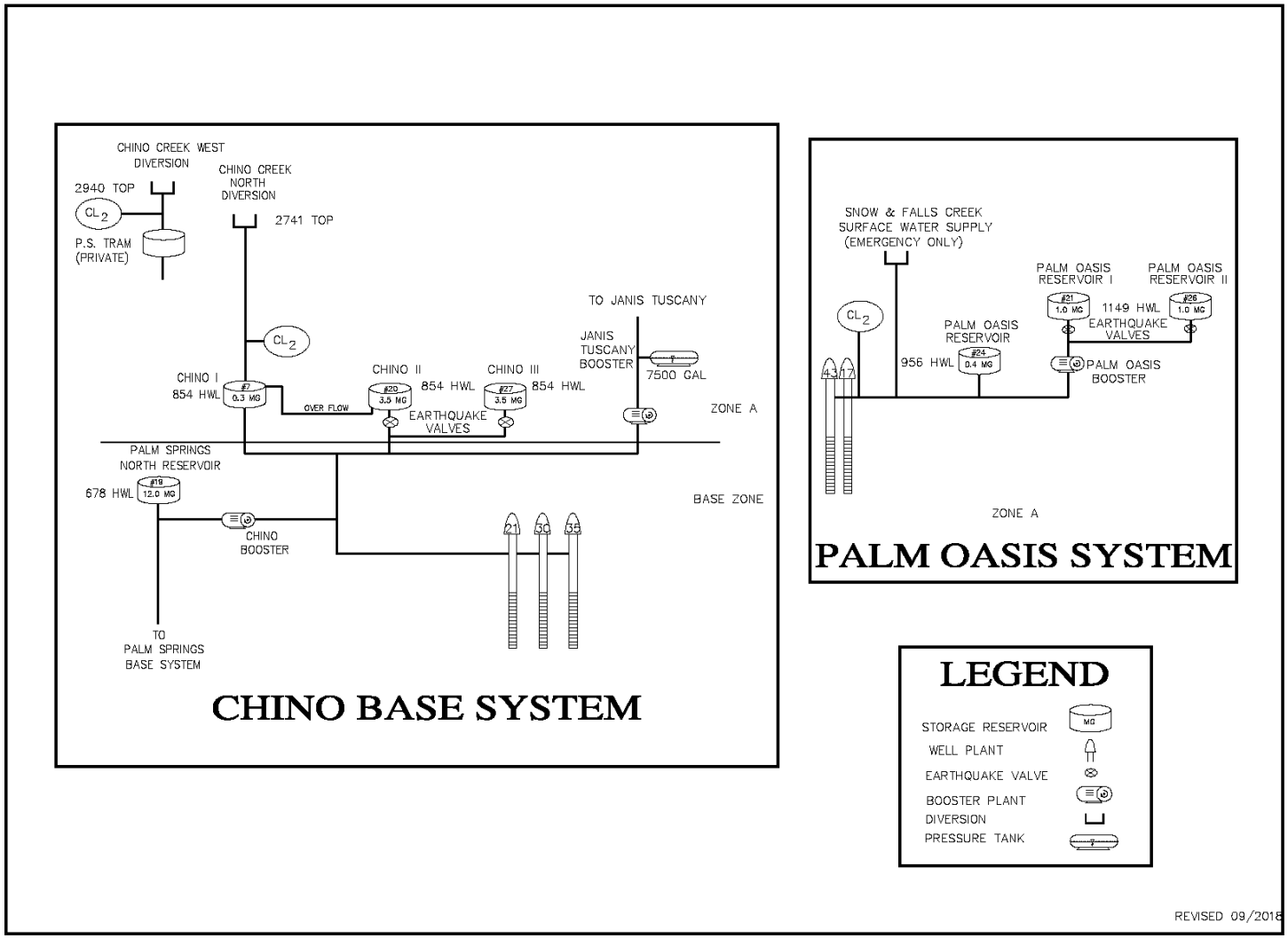
This water loss audit report meets the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34 and has been prepared in accordance with the method adopted by the American Water Works Association, as contained in their manual, *Water Audit and Loss Control Programs, Manual M36, Fourth Edition* and in the Free Water Audit Software version 5.

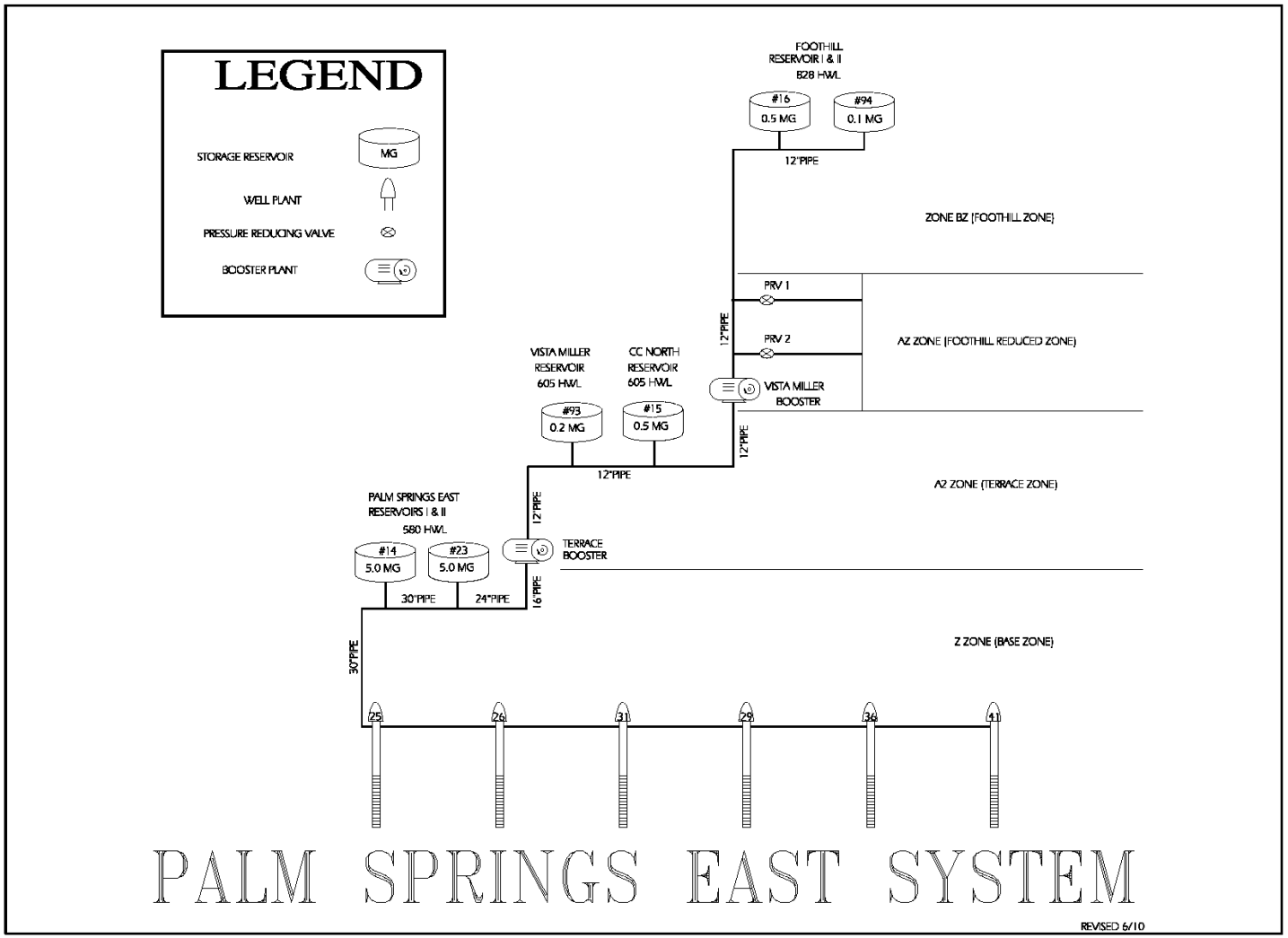
Executive Name (Print)	Executive Position	Signature	Date
Steve Johnson	Assistant General Manager	Steve L. Johnson Digitally signed by Steve L. Johnson Date: 2020.09.29 07:30:50 -07'00'	9/29/20

APPENDIX A: Level 1 Validation Notes Template

Pre-Interview Notes	Supplier has provided a system schematic(s) and all required supporting documentation for the report. There have been no new major facility additions to the system since last year's audit. Upon initial review of the 2019 report it was noted that the ILI has decreased significantly from the previous year's report. In reviewing the input data, it seems as though a decrease in water supplied has resulted in this change. The Supplier indicated they have verified all input data for the "Volume Own Sources" is correct to the best of their knowledge and within the confines of the data validity grade assigned for this input. A summary of the expansion of the meter bench test program was provided by the Supplier as an explanation for the increase in data validity grade for Customer Metering Inaccuracies.


LEGEND
STORAGE RESERVOIR
MG
WELL PLANT
EARTHQUAKE OR ALTITUDE VALVE
BOOSTER PLANT
DIVERSION
HYDROELECTRIC PLANT
SNOW CREEK VILLAGE
DIVERSION SNOW CREEK
1986 TOP
FALLS CREEK DIVERSION
1906 TOP
1974 HWL
CL2
#22 1.0 MG
SNOW CREEK EQUALIZING
ALTITUDE VALVE
1437 HWL
#18 0.15 MG
TO SNOW CREEK VILLAGE
SNOW CREEK VILLAGE RESERVOIR
SNOW CREEK
PRESSURE REGULATING STATION
UPPER SOUTHRIDGE
SOUTHRIDGE BOOSTER
ZONE C
SOUTHRIDGE 910 HWL
#17 0.3 MG
#8 0.1 MG
EMERGENCY SUPPLY TO PALM OASIS
CL2
ZONE B
LOWER SOUTHRIDGE
#25 1.5 MG
#31 1.5 MG
ANDREAS HILLS 880 HWL
#5 1.5 MG
PALM SPRINGS NORTH 696 HWL
TO CAHUILLA HILLS
ZONE A
ARABY 650 HWL
#6 0.3 MG
ARABY BOOSTER
ACANTO BOOSTER
PALM SPRINGS SOUTH 680 HWL
#13 5.0 MG
#30 5.0 MG
TAHQUITZ 680 HWL
#8 5.0 MG
#32 5.0 MG
#19 12.0 MG
PALM SPRINGS NORTH 678 HWL
TO CHINO SYSTEM
CHINO BOOSTER
ALTITUDE VALVE
BASE ZONE
40 39 16 14 6 32 24 3 11 20 23 5 18 10 22 27 28 9 33 34 37 38
PALM SPRINGS BASE SYSTEM
REVISED 09/2018


CHINO CREEK WEST DIVERSION
2940 TOP
CL2
P.S. TRAM (PRIVATE)
CHINO CREEK NORTH DIVERSION
2741 TOP
CL2
TO JANIS TUSCANY
JANIS TUSCANY BOOSTER
7500 GAL
CHINO I
854 HWL
#7 0.3 MG
OVER FLOW
CHINO II
#20 3.5 MG
854 HWL
CHINO III
#27 3.5 MG
854 HWL
EARTHQUAKE VALVES
ZONE A
PALM SPRINGS NORTH RESERVOIR
678 HWL
#19 12.0 MG
CHINO BOOSTER
BASE ZONE
21
30
35
TO PALM SPRINGS BASE SYSTEM
CHINO BASE SYSTEM
SNOW & FALLS CREEK SURFACE WATER SUPPLY (EMERGENCY ONLY)
PALM OASIS RESERVOIR I
#21 1.0 MG
PALM OASIS RESERVOIR II
#26 1.0 MG
1149 HWL
EARTHQUAKE VALVES
CL2
PALM OASIS RESERVOIR
#24 0.4 MG
956 HWL
PALM OASIS BOOSTER
43
17
ZONE A
PALM OASIS SYSTEM
LEGEND
STORAGE RESERVOIR
MG
WELL PLANT
EARTHQUAKE VALVE
BOOSTER PLANT
DIVERSION
PRESSURE TANK
REVISED 09/2018


LEGEND
STORAGE RESERVOIR
MG
WELL PLANT
PRESSURE REDUCING VALVE
BOOSTER PLANT
FOOTHILL RESERVOIR I & II
828 HWL
#16
0.5 MG
#94
0.1 MG
12"PIPE
ZONE BZ (FOOTHILL ZONE)
PRV 1
PRV 2
12"PIPE
AZ ZONE (FOOTHILL REDUCED ZONE)
VISTA MILLER RESERVOIR
605 HWL
CC NORTH RESERVOIR
605 HWL
VISTA MILLER BOOSTER
#93
0.2 MG
#15
0.5 MG
12"PIPE
12"PIPE
A2 ZONE (TERRACE ZONE)
PALM SPRINGS EAST RESERVOIRS I & II
580 HWL
#14
5.0 MG
#23
5.0 MG
12"PIPE
TERRACE BOOSTER
30"PIPE
24"PIPE
16"PIPE
30"PIPE
Z ZONE (BASE ZONE)
25
26
31
29
34
41
PALM SPRINGS EAST SYSTEM
REVISED 6/10

Level 1 Validation Summary Notes Template

Audit Input	Confirmation of Input Derivation	Confirmation of DVG Assignment
Volume from Own Sources (VOS)	Supply Meter Profile: The Desert Water Agency (DWA) has 33 groundwater wells of which 23 were active during the reported calendar year. Daily manual reads are performed at each site and given to Engineering secretary for entry into the WellPro database. DWA also has three surface water sources in the form of stream flows entering the system – only two of which were active during the current audit year. All sites are metered including surface water sources. VOS input data source: Manual reads of production meters which are entered into the WellPro database Comments: Confirmed input derivation from the supporting documents provided for well and stream reads. Confirmed the exclusion of any/all non-potable volumes of source water. Energy efficiency tests (i.e. accuracy tests) were conducted on only a small percentage of active wells (5 out of 23) during the 2019 calendar year. There were no accuracy tests performed on any wells during the previous audit year (i.e calendar year 2018). Accuracy tests were performed on the remaining active wells during the 2017 calendar year. It was noted the overall VOS input data was significantly lower than in the previous audit year. Supplier indicated they had verified the input data was accurate. Confirmed input value: 29,128.258 acre-ft/yr	Percent of VOS metered: 100% Signal calibration frequency: None Volumetric testing frequency: 21.7% of active meters (5 out of 23) were tested in the current audit year (i.e. calendar year 2019). The remaining active meters were tested in the 2017 calendar year. Volumetric testing method: Energy efficiency with pitot tube Percent of VOS tested and/or calibrated: 5 out of 23 active wells, which account for 34.1% of VOS, were tested in current audit year. The remaining active wells were tested in the 2017 calendar year. Comments: 34.1% of VOS in reported calendar year was accuracy tested in the current audit year. The remaining active meters were accuracy tested in the 2017 calendar year. There were no electronic calibration tests performed on any of the meters. A grade of 5 was assigned due to the fact that greater than 25% (34.8%) of tested meters were found to be outside the +/- 6% accuracy range. Confirmed DVG: **5**
VOS Master Meter Error Adjustment	Adjustment Basis: Energy efficiency tests (i.e. accuracy tests) were performed on 5 of the 23 active well meters during the current audit year (i.e. C.Y. 2019) (34.1% of total VOS). Accuracy tests on the remaining active well meters were performed during the 2017 calendar year. The results of all said tests were provided with supporting documents. Net Storage Change Included: No Comments: Accuracy test results from C.Y. 2019 and 2017 were shown alongside DWA meter reads for all active meters. Change in production due to variance/meter	Supply meter read frequency: Daily Supply meter read method: Manual Frequency of data review: Monthly Storage level monitoring frequency: Yes (in real time via SCADA) Comments: As with last year's audit, a grade of 3 was confirmed due to no automatic (telemetry) data logging for the well meters. It should be noted that the Supplier has installed the facilities needed to automatically log well meter reads at a few of their sites. This process is still in the infancy stages, but the end goal is to have the ability to automatically log well meter reads via SCADA

Audit Input	Confirmation of Input Derivation	Confirmation of DVG Assignment
	inaccuracy was also included and an overall meter inaccuracy extrapolated from the data. The input value for the reported calendar year was higher (over-registering for current audit year) than what was reported the previous calendar year. This was due to the variance in production for each individual well site and accompanying changes in production from variance. Confirmed total DWA meter accuracy from data provided. Confirmed input value: 1.43%	at every well site. Storage levels for the reservoirs are reported in real-time via telemetry. However, changes in storage levels are not used in the MMSEA input. Confirmed DVG: **3**
Water Imported (WI)	Import meter profile: n/a WI Data Source: n/a Comments: n/a Confirmed input value: n/a	Percent of WI metered: n/a Signal calibration frequency: n/a Volumetric testing frequency: n/a Volumetric testing method: n/a Percent of WI tested and/or calibrated: n/a Comments: n/a Confirmed DVG: n/a
WI Master Meter Error Adjustment	Adjustment Basis: n/a Comments: n/a Confirmed input value: n/a	Import meter read frequency: n/a Import meter read method: n/a Frequency of data review: n/a Comments: n/a Confirmed DVG: n/a
Water Exported (WE)	Export meter profile: n/a WE Data Source: n/a	Percent of WE metered: n/a Signal calibration frequency: n/a Volumetric testing frequency: n/a Volumetric testing method: n/a

Level 1 Validation Summary Notes Template

Audit Input	Confirmation of Input Derivation	Confirmation of DVG Assignment
	Comments: n/a Confirmed input value: n/a	Percent of WE tested and/or calibrated: n/a Comments: n/a Confirmed DVG: n/a
WE Master Meter Error Adjustment	Adjustment Basis: n/a Comments: n/a Confirmed input value: n/a	Export meter read frequency: n/a Export meter read method: n/a Frequency of data review: n/a Comments: n/a Confirmed DVG: n/a
Billed Metered Authorized Consumption (BMAC)	Customer Meters & Reads Profile: - Age profile: Average age of meters is not known. However, meters are changed out on a 20-year cycle. There were approximately 1,850 meters changed out during the reported calendar year with conversion to AMR. - Reading system: For the reported calendar year, the reading system was a mixture of manual read (21%) and AMR (79%) meters. - Read frequency: Monthly Billing Data Pro-rated? No Comments: Exclusion of any/all non-potable consumption volumes was confirmed	Percent of customers metered: 100% Small meter testing policy: Existing testing is limited and mainly based on customer complaints and/or accounts that have been flagged for high consumption. All new meters are tested via test bench for accuracy (based on manufacturer's specifications) prior to installation in the field. Supplier is working on developing guidelines for testing other subsets of meters in order to obtain a more representative sample of the full meter population. Number of small meters testing/year: Approximately 6 per year Large meter testing policy: Reactive testing based on customer complaints and/or accounts that have been flagged due to high consumption.

Audit Input	Confirmation of Input Derivation	Confirmation of DVG Assignment
	based on data provided. There was no lag-time correction(s) applied to the input derivation. The data input for billed metered experienced a decrease from the previous calendar year.	Number of large meter tested/year: No large meters tested during the reported calendar year. Meter replacement policy: Ongoing meter replacement policy based on a 20 year cycle at a rate of approximately 7% each year with conversion from manual read to AMR. Supplier is working on developing guidelines for testing other subsets of meters in order to obtain a more representative sample of the full meter population. Number of replacements/year: Historically, approximately 1,000 meters are replaced annually mainly due to old age. In the reported calendar year, approximately 1,850 meters were replaced with conversion to AMR. Billing data auditing practice: Standard billing QC with volume review by use type (by zone) for each billing cycle. Zones have been updated for the reported calendar year. Select accounts are audited annually by the financial auditor. Comments: 100% of customers are metered. Meter replacement program is in place (20 year cycle), but existing meters are only tested on a reactive basis. All new AMR meters are accuracy tested via test bench prior to installation in the field. Supplier is in the process of developing an updated meter testing program. Grade of 7 is confirmed based 100% of customers being metered, good record keeping, testing of all new AMR meters, and annually auditing by third party auditor. However, only limited meter accuracy testing is conducted on existing meters.

Level 1 Validation Summary Notes Template

Audit Input	Confirmation of Input Derivation	Confirmation of DVG Assignment
	Confirmed input value: 28,112.120 acre-ft/yr	Confirmed DVG: **7**
Billed Unmetered Authorized Consumption (BUAC)	Billed Unmetered Profile: n/a Input Derivation: n/a Comments: n/a Confirmed input value: n/a	Policy for metering exemptions: n/a Comments: n/a Confirmed DVG: n/a
Unbilled Metered Authorized Consumption (UMAC)	Unbilled Metered Profile: UMAC consists of DWA facility use and private fire services (via detector check) only. Input Derivation: Based on regular meter readings. Comments: Confirmed input derivation from supporting documents provided. Confirmed input value: 368.224 acre-ft/yr	Policy for billing exemptions: Billing exemptions are limited to DWA facilities only. Comments: Grade of 3 based on the absence of any dated written procedures for billing exemption. Confirmed DVG: **3**
Unbilled Unmetered Authorized Consumption (UUAC)	Unbilled Unmetered Profile: UUAC consists of water used for operational flushing and fire-fighting water used by fire departments. Input Derivation if Estimated: Flushing reports are provided by the construction department for each event and include information such as location, pressure, outlet size, and duration of flush. Engineering technicians use information from said forms along with Greely's formula of water through an orifice to calculate the volume of water used per flushing event. The fire department provides the same forms and information for every fire-fighting event. Engineering technicians use the same formula to calculate water use in these cases.	Default or Adjusted Default Applied: No Completeness of Documentation: Total volumes for flushing and fire-fighting were provided (listed per event with monthly totals). Individual flushing reports were also made available to help verify completeness of the data. Comments: Grade of 10 confirmed based on the existence of clear policies identifying permitted use of unbilled, unmetered water. Detailed, complete records exist for each occurrence and a known

Audit Input	Confirmation of Input Derivation	Confirmation of DVG Assignment
	Comments: Input derivation from supporting documents was confirmed. It should be noted the fire department is now utilizing the same forms and information to submit water use for fire-fighting incidents. This provides consistency in water use calculations. Confirmed input value: 71.237 acre-ft/yr	formula is utilized to calculate water volumes based on information provided for each occurrence. Confirmed DVG: **10**
Unauthorized Consumption (UC)	Default Applied? Yes. Input Derivation if Customized: n/a – Default input applied. Comments: Default input applied. Confirmed input value: 72.821 acre-ft/yr	Instances and extent of UC documented: None. Comments: Default grade applied. Confirmed DVG: **5**
Customer Metering Inaccuracies (CMI)	Input Derivation: See BMAC regarding meter testing activities and meter replacement programs. Input derivation is estimated based on reference data (i.e. manufacturer's specs) as well as meter bench test results. 0.80% error adjustment was calculated using limited bench test results and weighted averages based on meter population size and age. Approximately 1,850 meters (or approximately 8% of inventory) tested prior to installation in the system during the current audit year. In addition, more routine meter bench testing was conducted on existing meters during the current audit year. The meter test bench program is in the process of being expanded to include other subsets of meters in order to gain a better representative of the full meter population. Comments: There were no test results provided. The process for testing new meters prior to installation was described by the Supplier in detail. A detailed method for determining meter accuracy by age and size using limited bench test results and weighted averages based on meter population age and size was described by the Supplier.	Characterization of meter testing: Routine testing of all new meters is performed prior to installation in the field. Meter testing on existing (older) meters is being expanded in addition to reactive testing (although program is not fully operational). Characterization of meter replacement: Annual meter replacement based on 20 year cycle. The oldest meters are replaced at an average rate (historically) of approximately 1,700 meters per year. There were approximately 1,850 meters replaced and converted to AMR during the reported calendar year. Comments: Grade of 7 assigned by Supplier based on good recordkeeping and more routine meter bench testing program (although still not fully operational). Customer meter accuracy was calculated by Staff using limited bench test results

Audit Input	Confirmation of Input Derivation	Confirmation of DVG Assignment
		and weighted averages based on meter population size and age. There were approximately 1,850 meters replaced during the current audit year (with all new meters being accuracy tested) and converted to AMR. Data is improving due to more routine meter bench testing as well as the increasing percentage of AMR meters in the system (79% AMR to 21% manual read in the reported calendar year).
	Confirmed input value: 229.680 acre-ft/yr	Confirmed DVG: **7**
Systematic Data Handling Errors (SDHE)	Input Derivation: n/a – default input applied.	If custom estimate provided -- Characterization of read collection & billing process: n/a
	Comments: Default input applied.	Characterization of billing process and billing data auditing: n/a
	Confirmed input value: 70.280 acre-ft/yr	Confirmed DVG: **5**
Length of Mains	Input Derivation: Data taken from Pipe database which is updated on a regular basis.	Mapping format: Paper. Maps are updated via AutoCAD.
	Hydrant lateral length included: Yes.	Asset management database: Database does exist and is updated on a regular basis. However, said database exists separately from a GIS system.
	Comments: Fire hydrant and fire service lateral lengths have been included in the total length of mains. Said lengths were calculated using the total number of hydrants and fire services multiplied by the average length of run which is estimated to be 30 feet.	Map updates & field validation: Updates to system maps and field validation of pipe lengths occur during processing of project work orders. Said data is updated as each project is completed.
		Comments: Grade of 7 was based on the Supplier having a sound, written policy in place for new main installation. Data is updated on a regular basis in electronic format and accurate paper maps are utilized. Updates to data occur as projects are completed.

Level 1 Validation Summary Notes Template

Audit Input	Confirmation of Input Derivation	Confirmation of DVG Assignment
	Confirmed input value: 424.7 miles	The existing database is separate from a GIS system at this time. Steps are being taken to implement a GIS system in the near future. Confirmed DVG: **7**
Number of Active and Inactive Service Connections	Input Derivation: Data is taken from the billing system and the annual Op/Stat report. Basis for database query: Meter and account identification by the IT department. Comments: The annual Op/Stat report takes into account all active and inactive domestic water services. Verified that any/all reclaimed services, fire services, private wells, and/or temporary construction meters were excluded from total count. Confirmed that abandoned services have been excluded from the input value. Confirmed input value: 25,508	CIS updates & field validation: Updates are achieved through routine meter reading procedures. Field verification is usually limited to requested site visits. It should be noted that additional field verifications were performed in the reported calendar year in an effort to identify services that had been abandoned but were still being counted. Estimated error of total count within: Between 2 and 3% Comments: Grade of 7 based on a computerized management system being in place. Well written procedures and policies existing for new account activation and billing. Field verification is limited. However, additional field verification was performed in reported calendar year. Error in total number of service connections is believed to be between 2 and 3%. Confirmed DVG: **7**
Average Length of Customer Service Line	Are customer meters at the curbstop? Yes. Where are customer meters installed if not at curbstop? At property line. Customer service line derivation: Default input applied. Comments: Customer meters are typically installed at curb stop or property line. Default input value of 0 applied. Confirmed input value: 0.	Comments: Default grade of 10 applied. Confirmed DVG: **10**

Level 1 Validation Summary Notes Template

Audit Input	Confirmation of Input Derivation	Confirmation of DVG Assignment
Average Operating Pressure	Number of zones, general setup: Wide valley floor with varying ground elevations and 13 different pressure zones. Typical pressure range: 40 to 140 psi. Input derivation: Supplier used calculations and weighted averages for each zone based on the number of accounts and median pressure within each zone. From this information, Supplier calculated the weighted average pressure within each zone as, subsequently, the total weighted average pressure for the system. Comments: Pressure is mapped using storage tank elevations (water levels are electronically recorded in SCADA) and topographical data. Same calculations used as in previous audit year. Confirmed input value: 79.7 psi.	Extent of static pressure data collection: Pressure data is collected with gauges in response to low pressure complaints by customers and fire flow testing by the local fire departments. Characterization of real-time pressure data collection: Real-time data monitoring is limited to booster stations and storage tank levels. Hydraulic model in place? Calibrated?: A hydraulic model is in place. However, the model has not been recently calibrated. Comments: Grade of 5 was confirmed based on using calculations and weighted average for each zone to determine a weighted average pressure for the system. A hydraulic model is in place, but has not been recently calibrated. Real-time source data (i.e. reservoirs and boosters) is brought in electronically via SCADA. Pressure verification via gauges for customer low pressure complaints and fire flow test data from the fire departments. System has color coded valves that act as effective pressure controls to separate the different zones. Very rarely are these valves found to be accidentally open. Confirmed DVG: **5**
Total Operating Cost (TOC)	Input Derivation: Data is taken from official financial reports. Comments: Confirmed that costs provided were limited to water system only (including water debt service). Process of determining TOC same as in previous audit year.	Frequency of internal auditing: Annually. Frequency of third-party CPA auditing: Annually. Comments: Grade of 10 confirmed based on reliable electronic accounting system in place which tracks all operating costs for water system. Annual auditing is performed by Agency personnel.

Level 1 Validation Summary Notes Template

Audit Input	Confirmation of Input Derivation	Confirmation of DVG Assignment
	Confirmed input value: $27,896,593 $/yr	Annual auditing is also performed by a third party CPA. Confirmed DVG: **10**
Customer Retail Unit Cost (CRUC)	Input Derivation: As in previous years, weighted average ($/100 cu. ft.) based on percentage of total volume sold multiplied by unit rate for each rate type. Sewer Charges Volumetric? No. Sewer Charges Included? No sewer charges were incorporated into the calculation for the reported calendar year. Comments: There were not sewer charges incorporated into the calculation for the reported calendar year. Construction meter charges were incorporated. Confirmed input value: $2.02 ($/100 cubic feet (ccf))	Characterization of calculation: All rate types are weighted based on % of total volume sold and a weighted composite average is calculated using these values. Comments: Grade of 9 based on the calculations having not been reviewed by an M36 water loss expert. No change from previous audit year. Recommend said review in order to increase grade for next year. Confirmed DVG: **9**
Variable Production Cost (VPC)	Supply profile: Own sources only. No imported or exported water. Direct variable costs included: Primary costs include internal source of supply, pumping expense (power), and treatment costs are included. Secondary costs included: Wear and tear on equipment is incorporated into pumping expense. Comments: No additional comment. Confirmed input value: $280.56 ($/acre-ft)	Characterization of calculation: Variable production cost is a weighted average composite of all rates/costs (i.e. source of supply, pumping expense, and treatment). No change from last year in terms of method. Comments: Grade of 7 confirmed based on inclusion of primary costs in addition to some secondary costs. Reliable accounting system in place. All data is audited at least annually by Agency personnel. Data has not been audited by a third party agency knowledgeable in M36 methodology. Recommend taking this additional step to increase score for next year. Confirmed DVG: **7**

Level 1 Validation Summary Notes Template

Audit Input	Confirmation of Input Derivation	Confirmation of DVG Assignment
Pending Items needed to complete the validation	All required documents have been provided and additional explanation given upon request. No further information is needed to complete the validation.	
Key Audit Metrics	Data Validity Score: 62 ILI: 0.37 Data Validity Band (Level): Band III (51-70) Real Loss: 7.14 (gal/connection/day) Annual Cost of Real Losses: $179,410 Apparent Loss: 13.05 (gal/connection/day) Annual Cost of Apparent Losses: $328,015	
Infrastructure & Water Loss Management Practices:	Infrastructure age is approximately 40 years old based on weighted average of each age group of pipe within the system. The Supplier has increased the length of pipe being replaced due to age and/or leaks each year which will help improve the average age of pipe in the system. Agency personnel use the pipes database to prioritize mains based on a number of different categories (i.e. year installed, number of total and recent leaks, cost for repairs, etc.) in order to determine which mains to replace in a given year. Based on the pipes database, the total number of leaks detected and repaired for the reported calendar year (C.Y. 2019) was 889. This is an improvement over last year's audit number. The current method of proactive leakage management is leak detection and repair, pipeline replacement, and pressure management. The current meter replacement program consists of meters being replaced on a 20 year cycle. Supplier has expanded the meter bench test program to include additional subsets of meters, although program is not fully operational.	
Comments on Audit Metrics & Recommendations for Validity Improvements:	The infrastructure leakage index (ILI) of 0.37 suggests that this particular system experiences leakage at a rate that is 0.37 times the modeled technical minimum based on the characteristics of the system being audited. The ILI has improved drastically since last year's audit – mainly due to a greater decrease in water supplied versus authorized consumption (lessened the gap between these two inputs significantly) as well as improved identification of apparent losses vs. real losses. I spoke to Supplier about the water supplied input being much lower than the previous year. They indicated they verified all input data was correct. The Data Validity Score fell within Band III (51-70) which suggests that future steps should be taken to focus on improving the reliability of the input data and exploring ways of improving/preventing water and revenue loss. It should be noted that the Supplier did improve the accuracy in some areas including unbilled unmetered water by utilizing formula as a standard for all types of usage in this category and maintaining detailed records. The grade for customer meter inaccuracies improved due to an expansion of routine testing via the meter bench test program (not yet fully operational). Due the increase in data the Supplier was able to calculate a more accurate percentage using limited bench test results and weighted averages based on meter population size and age. This program is continually improving and the Supplier hopes to have it fully operational in the near future. They are also budgeting for implementation of a GIS program which will help increase accuracy of data, etc. The Supplier has installed facilities to enable automatic logging of well meter data via SCADA (system not in use). They hope to continue this process until all well meters have the ability for automatic data logging via SCADA. Suggestions for improving the overall data validity grade include:	

Level 1 Validation Summary Notes Template

Audit Input	Confirmation of Input Derivation	Confirmation of DVG Assignment
	- Complete implementation of the meter testing program which will expand the small and large, new and old meters tested on an annual basis. - Completing installation of telemetry for all well meters in order to enable electronic calibration testing and automatic data logging. If calibration testing is performed annually on all active well meters it would increase reliability. - Implementation of the GIS program.	